

Appendix D - Multifamily Building (5+ Unit) Weatherization Measures, Improvements, and Specifications

D.1 General Policy and Specifications

- 1) All work will be completed in a professional manner.
- 2) All materials will be installed according to manufacturer specifications. For more specific information on installation procedures and guidance see the Wisconsin Weatherization Field Guide.
- 3) All debris shall be removed from the job site and disposed of properly. Any hazardous materials shall be properly disposed of or recycled where appropriate.
- 4) All work will follow the Wisconsin Commercial Building Code, any commissioning requirements as applicable or other codes and regulations by the authority having jurisdiction.
- 5) Building permits, plan review and approval, and any related costs are the responsibility of the Grantee, or contractor implementing a measure under contract to the Grantee.
- 6) Contractors providing services in five plus unit buildings shall be licensed and/or registered to provide those services, if required by the authority having jurisdiction.
- 7) The Division Administrator or his/her designee will be the final authority for any questions regarding these specifications and measures.
- 8) A minimum inspection sample of 8 units or 25%, whichever is larger, is required for all buildings. The inspection sample shall include units from each floor and each building exterior wall orientation (e.g. direction), and shall be representative of each type of unit in the building. All common areas shall be inspected and addressed in the energy audit.
- 9) Building owner contributions may be used to cover the cost (or portion of the cost) of any weatherization measure allowed by the State of Wisconsin that does not meet a minimum 1.0 SIR test as a part of their contribution toward the weatherization of the building, under the following conditions:
 - a. The owner's contribution shall be equal to or exceed the buy-down amount needed to generate an SIR greater than or equal to 1.0.
 - b. The owner's contribution shall be at least 15% of the total cost of measures performed when the heat is master-metered.
 - c. The buy-down of measures shall not result in other cost-effective measures being dropped from the improvement package. All measures that were cost-effective after the initial energy audit is conducted shall remain on the list of measures to be completed at the property.
 - d. The cumulative SIR of the building's measures package shall be greater than or equal to 1.0.
 - e. There shall be documentation in the building/customer file of the energy audit, including measures that will be completed which have an initial SIR of less than 1.0.
 - f. A summary of all costs associated with the weatherization of the building, including non-federal resources, shall be retained in the building/customer file. For 5-24 unit buildings, use the Owner Contribution worksheet, which is part of the 5-24 Unit Workbook, to document the calculations in the file.

- g. Where owner contributions are substantial, it is recommended the contribution be received in advance and placed into an escrow account prior to starting weatherization work.
- 10) Weatherization measures that will change the appearance of buildings that are 50 years or older are subject to review by the Wisconsin Historical Society. See the Wisconsin Weatherization Program Manual, Chapter 8.5 for more information and instructions.
- 11) Grantees shall make every effort to install products meeting ENERGY STAR® standards, whenever feasible. They are listed as materials specifications in several places. If a product meeting ENERGY STAR® standards is not available, request approval from the Division to use another product (see lighting exception below). Products that meet ENERGY STAR® standards do not require prior approval. Note: Grantees may use www.energystar.gov/CFLs to check for availability of ENERGY STAR® rated CFLs, and use other energy efficient lighting types when ENERGY STAR® is not available, documenting this in the customer file.
- 12) All materials used shall meet the requirements outlined in the Weatherization Manual, Chapter 11 - Weatherization Materials.
- 13) All weatherization work shall be completed in an asbestos and lead-safe manner, as applicable. Where required, lead-safe work shall be supervised by a certified Lead Safe Renovator. For more information, see the Weatherization Manual Chapter 12.2 Lead Safe Weatherization and Appendix G – Minimum Standards for Lead Safety Weatherization (LSW), and see section 12.4 on asbestos and Appendix H - Asbestos Containing Materials (ACM) Policy and Procedures.
- 14) The Wisconsin Department of Natural Resources (DNR) requires 5+ unit buildings be inspected for asbestos by a Certified Asbestos Inspector prior to renovation. See the following DNR fact sheet for details on when notification to DNR is required: <http://dnr.wi.gov/air/pdf/asbestosfactsheet.pdf>
- 15) Fuel consumption documentation requirements.
 - a. Master metered 5-24 unit buildings shall have heating fuel consumption records for the preceding 12 months submitted by the building owner as a part of the certification process.
 - b. Master metered buildings with 25+ units shall have actual master meter consumption records for both heating and electrical records.
 - c. Buildings with individual mechanical systems in each unit shall have the actual consumption records for each unit. Tenants not certified as Home Energy Plus eligible (free riders) will need to provide fuel consumption records to the building owner or the grantee.
 - i. When fuel records are unavailable, free riders will need to sign a release to allow access to their utility records.
 - d. When fuel records are not available for individual units, use the Therm Calculator worksheet in the 5-24 Unit Workbook. This calculator will project the total building fuel consumption using a median consumption projection for units without actual data, based on heating costs or partial consumption data.
- 16) Buildings with 5 to 24 units will be modeled using the NEAT audit.
 - a. Actual fuel records or Therm Calculator projections shall be used in conjunction with the energy audit.
 - b. Use the 5-24 Unit Workbook posted on the Home Energy Plus website (<http://homeenergyplus.wi.gov/category.asp?linkcatid=494&linkid=122&locid=25>) to generate savings information for multiple measures. The savings information

- and costs shall be incorporated into NEAT's Itemized Cost section to evaluate multiple measures.
- c. Single measures or measures not addressed in the 5-24 Unit Workbook shall be modeled in the appropriate NEAT tab.
- 17) Buildings with 25 units or more:
- a. Shall be modeled using the TREAT audit, using a DES-designated auditor.
 - b. Shall use actual heating and electrical consumption records in conjunction with the energy audit.
 - c. Shall be submitted for DES review at the following stages:
 - i. After building assessment and utility consumption are complete.
 - ii. When TREAT audit is completed.
 - iii. When estimated costs are obtained for modeled measures.
 - iv. When bid specifications are completed (for measures that will be bid).
 - v. When bids are received.
 - vi. When the building is completed.
- 18) Grantees shall provide the property owner with all design documents related to the building's improvement. This includes documents such as a drawings, manuals, work plans, and warranties. The service provider is also required to demonstrate to the owner or their representative start-up, operation, control, adjustment, and trouble-shooting of various equipment upgrades. These requirements are outlined in Section D.7, Property Owner Education Standards.
- 19) Instructions for modeling 5-24 unit buildings using the Weatherization Assistant software are posted on the Home Energy Plus website under Weatherization Assistant Audits:
<http://homeenergyplus.wi.gov/category.asp?linkcatid=494&linkid=122&locid=25>

D.2 Building Shell Measures

In most cases, the entire building exterior shell will be modeled with NEAT or TREAT. NEAT modeling may include separate audits for each unit or the units may be modeled for cumulative measures and average conditions. This is contingent on the building design. As noted above, actual data from a representative sample of 25% of a building's units is required using either audit.

D.2.1 Ceiling or Attic Areas

General Policy: Model all ceiling/attic spaces for insulation up to R-50. Model the maximum capacity that the space can accommodate and the energy audit will model. Install the level of insulation the energy audit selects with an SIR greater than or equal to 1.0. Determine the effective R-value of the existing insulation based on the number of gaps in the insulation coverage. Seal applicable key junctures and bypasses prior to insulating. Incorporate related repair cost into the ceiling/attic insulation costs.

Specifications:

- 1) Install insulation in such a manner that there is complete and consistent coverage of the area with no gaps, mounds, or untreated penetrations through the field of insulation.
- 2) Determine the effective R-value of existing insulation by assessing the gaps in the insulation coverage. Use the following information to guide effective R-value estimates.

- a. Good - One inch of insulation in good condition with unbroken coverage will have an R-value between 2.5 and 3.75 (contingent on the type of product).
 - b. Fair - One inch of insulation in fair condition (small gaps and penetrations) will have an R-value between 1.75 and 2.6 (approximate 30% loss in R-value).
 - c. Poor - One inch of insulation in poor condition (a number of gaps and penetrations) will have an R-value between 1.0 and 1.5 (approximate 60% loss in R-value).
- 3) Insulate hatches or doors to the R-value of the ceiling/attic insulation or the maximum structurally allowable, whichever is lower. Pre-fabricated scuttles may be used. Box around scuttles to allow for repeated access. Secure the hatch with mechanical fasteners.
 - 4) Insulate limited-access ceilings or attics, such as vertical, horizontal, or sloped to the maximum structurally allowable. Common methods include the “dense pack” technique for loose-fill insulation or rigid insulation installed with a roof cap.
 - 5) The cost of necessary repair measures shall be included with the energy conservation measure (ECM) being modeled.
 - 6) Seal important joints, chases, chutes, and bypasses before or during insulation.
 - 7) Vent all exhaust fans to the exterior and seal and insulate the exhaust duct to a minimum of R-6.
 - 8) Build barriers around fan housings, recessed lighting, and knob and tube wiring as part of ceiling/attic preparation procedures.
 - 9) Install roof venting as needed.
 - 10) Post an insulation certificate near the entrance to the treated area.

D.2.2 Sidewall Insulation

General Policy: Model all uninsulated exterior walls of heated spaces to the maximum structurally allowable. Install insulation if the SIR is greater than or equal to 1.0. Incorporate related repair cost into the sidewall insulation costs.

Specifications:

- 1) Insulate the sidewalls using the “dense pack” technique for loose-fill insulation.
 - a. Other insulation products are subject to review and approval by the Division of Energy Services.
- 2) Follow procedures in the WI Weatherization Field Guide for insulation blower setting and installation techniques.

D.2.3 Foundation Insulation

General Policy: Model foundation walls or floors that define the heating envelope, including the exterior walls of unintentionally conditioned crawlspaces, sill boxes, and slab-on-grade assemblies, for insulation with an energy audit. Start with modeling the maximum R-value the energy audit allows, based on structural capacity. Install the R-value that generates the highest SIR greater than 1.0, or provides the best R-value within the package of improvements. Install insulation only if the SIR is greater than or equal to 1.0. Incorporate related repair cost into the foundation insulation costs.

Specifications:

- 1) Insulate floors where they define the heating envelope to the maximum R-value structurally allowable.
- 2) Insulate the accessible areas of slab-on-grade foundations to a minimum of R-5, and to a maximum of 6" below grade. Use foam board with a durable weather resistant coating.
- 3) Seal and insulate accessible crawl space walls to a minimum of R-12 and to a maximum of R-19. Typical applications include fiberglass insulation, 2-part foam, or rigid insulation.
 - a. Install a vapor retarder over exposed earth in limited-access crawl spaces.
 - b. Do not install a vapor retarder in any traffic area.
- 4) Seal and insulate sill box areas using faced fiberglass, rigid board, or 2-part foam up to a maximum of R-19. The sill box area shall be sealed prior to insulating.
- 5) Do not install insulation if it will cause or worsen an existing moisture problem.
- 6) Follow procedures in the WI Weatherization Field Guide for installation techniques.

D.2.4 Window Replacement

General Policy: Model windows that meet the replacement criteria as an improvement. Replacement windows shall meet ENERGY STAR® standards. Replace the window as an ECM if the SIR is greater than or equal to 1.0. Building owners may opt to replace existing windows that do not meet a minimum 1.0 SIR test as a part of their contribution toward the weatherization of the building. The owner's contribution shall be equal to or exceed the buy-down amount needed to generate an SIR equal to or greater than 1.0.

Specifications:

- 1) Windows to be replaced shall be located in the primary heating envelope and shall be beyond repair (e.g. have rotted or deteriorated frames or sashes). Cloudiness inside insulated glass (IG) units because of seal leakage does not constitute "failure" of the window or of the IG unit.
- 2) Re-weather stripping of existing windows is allowed as an air sealing measure.
- 3) Photographs of 25% of the windows to be replaced shall document why the windows were replaced (e.g., rotted frames or rotted sashes). The sample shall be representative of each floor and each building exterior wall orientation (e.g. direction).
- 3) A window with a cracked or broken pane of glass, but where degradation of the frame and or sash is not occurring, will have only the glass repaired or replaced.
- 4) Window replacement in pre-1978 buildings shall be completed using lead-safe work practices, under the supervision of a certified Lead Safe Renovator. For more information see the Weatherization Manual Chapter 12.2. – Lead Safe Weatherization and Appendix G – Minimum Standards for Lead Safe Weatherization (LSW).
- 5) Window replacements in buildings that are 50 years old or older are subject to historic review by the Wisconsin Historical Society.

D.2.5 Door Replacement

General Policy: Model doors that are deteriorated beyond repair for replacement as an improvement or a repair. Doors may be replaced within the entire improvement package or when the building has a cumulative SIR equal to or greater than 1.0.

Specifications:

- 1) Replacement doors shall have a maximum U-value of .2.
- 2) Replacement patio doors are not an allowable measure. Doors may be replaced only if the door is in the primary heating envelope and has any of the following characteristics:
 - a. Rotting is occurring on either the door jamb or the door blank.
 - b. Holes or cracks are present in the door jamb or door blank.
 - c. Door repair will not allow the door to operate correctly.
- 3) Photographs shall be taken of all doors to be replaced.
- 4) Door replacements in buildings that are 50 years old or older are subject to historic review by the Wisconsin Historical Society.

D.2.6 Air Sealing

General Policy: In 5-24 unit buildings, complete pre- and post-retrofit blower door tests whenever feasible. Seal all probable heat bypasses and key junctures. Repair or replace glass as needed. Whenever feasible, based on site-specific conditions, use diagnostic tools such as depressurization, infrared scanners, and smoke pencils to determine the appropriate sealing locations in the building, specific units, and common areas. Provide sealing work that will improve the thermal boundary of the building and address the tenant comfort zone. Air sealing procedures may differ between low-rise and high-rise buildings. Combustion safety procedures may differ between central versus individual combustion appliance zones (CAZ). For energy audit purposes, estimate the air leakage in the building by taking the square footage of the building surface above grade by a leakiness factor. Use the chart below as a guide for estimating air leakage per cubic feet per minute (CFM) per 50 Pascals.

Building Tightness Projections: 5+ Unit Buildings

(all measurements are CFM/square foot above grade)

Building Type	Pre-WX	Post WX	
		Average	Very Tight
Wood Frame		(25% Reduction)	(35% Reduction)
Average	1.00	0.75	0.66
Leaky	1.25	0.9	0.8
Very Leaky	1.5	1.1	0.9
Masonry	0.66	0.5	0.4

In the “Air and Duct Leakage” tab, enter the pre-CFM50 blower door reading and estimated post-CFM50 reading. The grantee’s average costs per cfm50 reduction will be entered in the cost box when you ‘tab’ through the empty box. Multiply the estimated cfm50 reduction by this amount and enter it into the cost box. If the cost entered differs from this amount there shall be documentation in the comments box as to why a different cost was entered for this job.

Specifications:

- 1) Prior to insulating, air seal as follows:
 - a. Use the Multi-family Building Air Sealing Checklist to check and air seal typical air leakage locations, including but not limited to, heat bypasses between party walls and between the building and buffer zones, and building's key junctures.
 - b. Whenever feasible, use depressurization, infrared scanners, and smoke pencils as diagnostic tools to guide air sealing of attic bypasses, the sill box area, and key junctures.
 - c. Replace missing or broken window glass and seal gross holes in the building envelope.
- 2) After insulating, provide sealing work that will improve conditions in the tenant’s comfort zone.
- 3) See section E. Health and Safety, E.1 Depressurization and Worst Case Draft Testing for information on safety tests that may have an impact on air sealing. All air sealing shall be completed using materials with the proper fire rating. See the Weatherization Manual, Chapter 11 – Weatherization Materials, for more information.
- 4) Where appropriate, follow the basic air sealing procedures in the WI Weatherization Field Guide.

D.3 Mechanical Systems Measures**D.3.1 Heating Unit Replacement**

General Policy: Model heating systems for replacement with an energy audit under the conditions listed below. The combustion efficiency of heating systems shall be measured. The annual efficiency shall be entered into the energy audit. Fuel switching replacement heating systems from oil, LP, or electric (furnace only) to natural gas is allowed when the total cost for fuel switching the system is modeled with an energy audit (or an SIR calculator) and the measure has an SIR of at least 1.0. The replacement of both primary and secondary heating systems is allowable as long as each replacement meets a minimum SIR of 1.0.

In TREAT model the primary and secondary heating systems. In TREAT model the primary system for replacement as an ECM first. In buildings with individual heating systems in each unit and/or common areas, test all heating systems in sample units. Total the BTU output capacity for the building and average the efficiency information in the energy audit.

Building owners may opt to replace existing heating systems that do not meet a minimum 1.0 SIR test as a part of their contribution toward the weatherization of the building. Miscellaneous heating system repair measures that are required for the heating system to function properly shall be incorporated with the cost of the heating system replacement. The owner’s contribution shall be equal to or exceed the buy-down amount to generate an SIR equal to or greater than 1.0. Note: as stated in the General Policy and Specifications, the buy-down of measures shall not result in other cost-effective measures being dropped

from the improvement package. All measures that were cost-effective after the initial energy audit is conducted shall remain on the list of measures to be completed at the property.

Replacement heating systems shall meet ENERGY STAR® standards whenever possible. Replacement heating systems that are not addressed in these specifications are subject to review and approval by the Division of Energy Services. All replacement heating systems shall follow the requirements of the Wisconsin Commercial Building Code, Comm 64 and the International Mechanical Code, as referenced by Comm 64 or any other commissioning requirements of the authority having jurisdiction.

- 1) Gas Heating Systems - Natural Draft: Model all gas-fired heating systems for replacement. Inspect fan-assisted systems for potential safety issues and model for replacement if safety issues cannot be repaired.
- 2) Gas Heating Systems - Sealed Combustion: Inspect systems for potential safety issues and model for replacement if safety issues cannot be repaired.
- 3) Oil Heating Systems: Model for replacement if the existing system is 10 years or greater in age. Inspect systems less than 10 years old for potential safety issues and model for replacement if safety issues cannot be repaired.
- 4) Space Heaters: Model for replacement if the existing space heater is 10 years or greater in age. If necessary, use the 5-24 Unit Workbook to generate savings information for multiple space heaters, incorporating the savings information and costs into NEAT's Itemized Cost section. Include all of the costs associated with the fuel switch in the replacement costs. Inspect systems less than 10 years old for potential safety issues and model for replacement if safety issues cannot be repaired.
- 5) Electric Furnace Conversion: Model for replacement with gas furnace with the energy audit or the Electric Heating System Conversion Calculator. Model conversion to a hydronic (boiler-driven) fan coil unit with TREAT. Include all of the costs associated with the fuel switch in the replacement costs. Inspect all units that will not be replaced for potential energy conservation measures and safety issues.

Specifications: All replacement heating systems, except wood burning units, shall meet the following minimum efficiency standards as listed in the AHRI Directory of Certified Product Performance: <http://www.ahridirectory.org/ahridirectory/pages/home.aspx>. The type of efficiency standard varies based on the fuel type and the heating system type (commercial versus residential).

Replacement Heating System Efficiency Requirements

Heating System	Fuel	AFUE (%)	Combustion Efficiency (%)	Thermal Efficiency (%)
Residential Furnace	Gas ¹	>=90%		
	Oil	>=83%		
Commercial Furnace (including rooftop units)	Gas			>=80%
	Oil			>=80%
Residential Boiler	Gas ¹	>=92%		
	Oil	>=83%		
Commercial Boilers	Gas ¹		>=94%	
	Light Oil		>=85%	
	Heavy Oil		>=83%	

1 Shall be sealed combustion, condensing type.

- 1) Use existing distribution system and gas supply line.
- 2) Properly remove and dispose of existing unit.
- 3) Provide an owner's manual with heating system replacements. Ensure that the owner or building manager receives training regarding effective operation, and procedures for start-up, operation, maintenance, and seasonal shut-down.
- 4) Install properly sized and commissioned units following the requirements of the Wisconsin Commercial Building Code or the authority having jurisdiction.
- 5) Install a condensate pump where needed to reach an appropriate drain. Condensate pipes generally may drain to 1) a laundry stand pipe; 2) a new standpipe, indirect or local waste pipe; or 3) a floor with a floor drain when the pipe can be properly secured and does not pose a hazard to the occupants. All installations require an air break. Condensate lines cannot be drilled directly into any drain pipe. For the more information see the Wisconsin Plumbing Code Comm 82.33. Condensate pumps may be installed using existing receptacles, new GFCI receptacles, or directly wired per manufacturer's recommendations.
- 6) When required, an approved gas pipe type will be installed, supported, and electrically bonded in accordance with NFPA-54. Follow the manufacturer's specifications for installation. For more information see NFPA-54/International Fuel Gas Code Chapter 4.
 - a. When CSST is present in the building and not correctly bonded, bond the gas piping system to the electrical ground in accordance with NEC 250.94 and 250.104.
- 7) Seal openings in chimneys where atmospheric vented appliances are eliminated. When sealed, a written notice on the chimney that the chimney is no longer functional is recommended.
- 8) The installer shall guarantee materials and labor for heating system replacement for a period of one year, starting from the date of satisfactory installation.

D.3.2 Other Heating Systems Work

General Policy: When possible, model the following measures/improvements with the energy audit. When an improvement is not a specific measure, incorporate it and any additional improvement that will maximize the heating system's efficiency, into the improvement package.

- 6) Natural Gas and LP Heating Systems that will not be replaced *may* receive a clean and tune, based on inspection. Oil heating systems that will not be replaced *shall* receive a clean and tune.
- 7) Distribution systems shall be evaluated and tested. Seal all hydronic return and supply leaks. Seal all large forced air return and supply leaks. Modify as needed. Seal and insulate ducts and make-up air cabinets in unheated areas.
- 8) Programmable thermostats may be installed on forced air systems when the existing thermostat must be replaced and the occupant is willing and able to program the replacement thermostat.
- 9) Duct air handler systems that supply secondary heat to common areas, via fan coil units fed by the central boiler, may be installed to eliminate a secondary heating system.
- 10) Improve controls to maximize energy savings.

Specifications:**1) Forced Air:**

- d. Clean and tune oil furnaces, unless replaced. Clean and tune gas furnaces if needed.
- e. Forced air distribution systems shall be inspected and tested for adequate return air and for health and safety problems.
- f. Seal all major return and supply leaks.
- g. There shall be adequate air flow for the system. Follow the manufacturer's recommendations. (Note: see the WI Weatherization Field Guide for additional guidance).
- h. Seal and insulate ductwork in unheated areas to R-10, including make-up air ducts for ventilation systems. In addition, when possible, incorporate the ducts into the heating envelope by insulating over the ducts to the R-value of the surrounding attic or crawl space insulation.
 - i. Install dampers and balance systems where ductwork is added.
 - ii. Install cold air returns to all first floor rooms where feasible, except for kitchen and bathrooms.
 - iii. Install cold air returns to second floor rooms as needed.
- iv. Cold-air return grills are not allowed in the combustion appliance zone and shall not be installed in unconditioned areas or unintentionally conditioned areas.
- v. Warm-air registers shall not be installed in the combustion appliance zone, unless the area is an intentionally conditioned area. Consult with building owner or manager about the removal of existing grills in the combustion appliance zone.
- i. Relocate existing thermostats that are located on exterior walls to interior walls, when the thermostat will not be replaced.
- j. Install programmable thermostats when the existing thermostat must be replaced and the occupant is willing and able to program the new thermostat. Every effort shall be made to upgrade existing non-programmable thermostats to programmable thermostats.
 - i. Instruct occupants on how to use the programmable thermostat.
 - ii. Programmable thermostats are the only allowable replacement thermostats that can be reported as an ECM.
 - iii. If a programmable replacement thermostat cannot be installed, a working thermostat shall not be replaced. If the current thermostat is non-functional, a conventional thermostat may be used but the cost shall be treated as a repair improvement and added to the improvement package. The rationale for this is that no energy savings is associated with a non-programmable thermostat. Report thermostats separately from heating system replacement costs.
- k. Replace oil filters.
- l. For existing forced air units, provide occupant with one (1) deep pleated (3" depth or more) disposable furnace filter, six (6) 1"-2" fiberglass disposable filters (1-installed, plus 5 replacement filters), or a permanent cleanable filter for forced air systems. If a deep pleated filter was provided when the furnace was cleaned and tuned, do not provide an additional filter.
 - i. Special filters for air cleaning may only be installed if approved by the Division.

- m. All forced air systems shall have a filter cover. Magnetic filter covers are allowable only if they provide an adequate seal to the ductwork to prevent air leakage.

2) Boilers:

Boiler distribution systems shall be inspected for proper operation.

- a. Flush the existing distribution system according to manufacturer's instructions. If instructions are not available, flush until water runs clear and free of sediment. For zoned systems, flush each zone separately.
- b. Ensure new circulating fluid is treated to meet boiler manufacturer's specifications. Install or replace a permanent chemical treatment system where required.
- c. Bleed air from the entire system.
- d. Install an automatic fill valve, air-excluding device, and back-flow preventer if they are not present.
- e. Install a compression tank, or fill the expansion tank and the system to the correct level. If an existing tank is a pre-pressurized diaphragm type and the tank is older than ten years, install a properly sized new one.
- f. Ensure all safety systems are operational. If a pressure relief valve is not present or not functioning properly, install one.
- g. Install an electric vent damper where feasible for standard efficiency models.
- h. Install thermostatically controlled radiator valves on the major radiators, when feasible.
- i. Install outdoor reset and boiler controls, if feasible.
- j. Inspect radiators. Clean, repair or replace as necessary.
- k. Install automatic and manual air bleed valves to eliminate air from each high point in the distribution system if they are not present and functioning properly.
- l. Inspect supply and return lines and connections and repair leaks.
- m. Insulate all accessible pipes within the boiler room and in other areas accessible and feasible within the heating envelope. Insulate pipes outside conditioned spaces.
 - i. For hot water systems, install one and a half-inch fiberglass insulation on all pipes less than or equal to one and a half inches, and two inches of fiberglass insulation on all pipes greater than one and a half inches in diameter.
 - ii. For steam systems, install one and a half-inch fiberglass insulation on all pipes less than or equal to one and a half inches, and three inches of fiberglass insulation on all pipes greater than one and a half inches in diameter.
- n. Extend new piping and radiators to conditioned areas, such as additions and finished basements currently heated by space heaters.
- o. Identify and model with the energy audit, either as an improvement or as part of the improvement package, any modification needed to maximize the efficiency of the boiler system.

3) Space heaters (non-wood and electric resistance baseboard) require:

- a. An air circulating fan (does not apply to baseboard).
- b. A properly grounded duplex receptacle for electrical service.
- c. A fire-rated floor protector if required per PMI, sized to the width and length of the space heater.

4) All heating system work:

- a. A tag shall be prominently affixed to the heating unit identifying who the customer should call for service. The tag information shall include the name, address, and telephone number of the service organization.
- b. Conduct Worst Case Draft (WCD) test of the combustion appliance zone and building depressurization tests in all jobs having naturally vented combustion appliances. The goal of this test is to ensure that all appliances are properly drafting. Documentation of the dwelling's WCD test results shall be included in the building file.

D.3.3 Water Heater Replacement

General Policy: Model water heater conversion or replacement as a measure or improvement with the energy audit, based on the criteria listed in the specifications. When needed to model multiple water heater replacements, use the 5-24 Unit Workbook to generate savings information. Incorporate the savings information and costs into NEAT's Itemized Cost section. Building owners may opt to replace existing domestic hot water heating systems that do not meet a minimum 1.0 SIR test as a part of their contribution toward the weatherization of the building. The owner's contribution shall be equal to or exceed the buy-down amount needed to reach an SIR of 1.0. The replacement system shall be properly sized. All work will follow the Wisconsin Commercial Building Code, any commissioning requirements that apply, or other codes and regulations by the authority having jurisdiction.

Specifications:

- 1) Gas to gas replacements or system conversion: Model direct-fired gas storage water heaters for replacement which are greater than 5 years old and have an Energy Factor (EF) of <.61. Replace the water heating system if the replacement has a minimum 1.0 SIR when modeled with the energy audit. The replacement water heater shall be one of the following:
 - a. Power-vented and have a minimum EF of .67 (for 40 and 50 gallon units) or a thermal efficiency of 95%.
 - i. 30 gallon water heaters shall have a minimum EF of .61, and may be installed only when the unit cannot be upgraded to a 40 gallon unit.
 - b. An indirect water heater working with a high-efficiency boiler system.
 - c. A heat pump water heater with an EF of 2.0 or greater.
 - d. One of the units listed above with a solar component. For solar water heaters modeled with the NEAT audit, use the itemized Cost section.
- 2) Fuel switch water heater conversions: Fuel switching replacement water heating systems from electric to gas or LP to natural gas is allowed when the total cost for fuel switching the system is modeled with the energy audit, the measure meets a minimum 1.0 SIR, and the building owner agrees to the conversion. Building owners may opt to replace existing water heating systems that do not meet a minimum 1.0 SIR test as a part of their contribution toward the weatherization of the building. The replacement system shall be properly sized and represent an increase in efficiency of at least 5% over the existing water heating system. The replacement shall be completed prior to the final inspection of the weatherization measures.

- 3) Electric to electric: Model the existing water heater system for replacement if the system is not properly sized, the water heater needs to be replaced based on safety concerns, or there is the potential to maximize energy efficiency. Replace the water heating system if the replacement has a minimum 1.0 SIR when modeled with the energy audit. The replacement water heater shall be one of the following:
 - a. An electric storage water heater with a minimum thermal efficiency of 98% for commercial units or .94 EF for individual units.
 - b. A heat pump water heater with an EF of 2.0 or greater.
 - c. One of the units listed above with a solar component. For solar water heaters, contact the Home Energy Plus Help Desk (heat@wisconsin.gov) for assistance in calculating the savings costs.
- 4) The replacement water heater(s) shall be sized properly for its intended use.
- 5) Removal and proper disposal of the old water heater is required.
- 6) Affix a tag to the water heater identifying who the customer should call for service. The tag shall be prominently displayed and include the service provider's name, address, and telephone number.

D.4 Baseload Measures

D.4.1 Lighting

General Policy: Convert incandescent lighting to more efficient fluorescent (CFL) and refraction lighting as a single improvement package or measure as identified in the specifications. Replace exit lighting with LED replacements. When needed, use the 5-24 Unit Workbook to generate the savings for lighting packages, incorporating the savings information and costs into NEAT's Itemized Cost section. Individual lighting may be modeled with the energy audit.

Specifications:

- 1) Package lighting conversion for the entire building in the following locations and conditions:
 - a. Exterior lighting that operates from dusk until dawn or longer.
 - b. Lighting in corridors and common areas, with occupancy sensors where feasible.
 - c. Model tenant lighting that is used most frequently for the longest duration.
- 2) Replacements CFLs shall meet ENERGY STAR® standards and the bulb shall be appropriate for the intended use. Note: Grantees may use www.energystar.gov/CFLs to check for availability of ENERGY STAR® rated CFLs, and use other energy efficient lighting types when ENERGY STAR® is not available, documenting this in the customer file.
 - a. The use of induction lighting to replace exterior mercury vapor or high pressure sodium lighting is allowed.
 - b. The use of LED lighting is allowed only in exit lights.
- 3) Replace all halogen torchieres in tenant areas with fluorescent equivalent fixtures; remove and dispose of old fixtures.
- 4) All replacement CFLs and fixtures shall be installed and inspected prior to the completion of the dwelling unit.

D.4.2 Domestic Water Heater Measures

General Policy: Insulate existing water heater tanks with less than R-10 insulation to a minimum of R-10. Water heaters that are ENERGY STAR® labeled are exempt from this requirement. Install low-flow showerheads and faucet flow restrictors. Insulate accessible hot and cold water pipes. Reduce water heater temperature to 120 degrees, where feasible.

Specifications:

- 1) Install 1.5 GPM or less showerheads and faucet aerators on every fixture.
- 2) For central boiler water heaters, insulate all accessible pipes within the boiler room, including the pipes in the circulating loop between the boiler and the water heater.
 - a. For hot water systems install one and a half-inch fiberglass insulation on all pipes less than or equal to one and a half inches and two inches of fiberglass insulation on all pipes greater than one and a half inches in diameter.
 - b. For steam systems install one and a half-inch fiberglass insulation on all pipes less than or equal to one and a half inches and three inches of fiberglass insulation on all pipes greater than one and a half inches in diameter.
- 3) Reduce water heater temperature to 120 degrees.
- 4) Where a recirculating pump is present, install an aquastat control on the return end of the loop to shut off the pump when the line is hot. Set the aquastat to turn on the pump when the line temperature drops to 110 degrees. Set the control to provide a deadband of 5 degrees or more.
- 5) Insulate existing water heater tanks with less than R-10 insulation to a minimum of R-10. Mechanical fasteners and tape are required.

D.4.3 Refrigerator Replacement and Removal

General Policy: Model all refrigerators with the energy audit. When needed, use the 5-24 Unit Workbook to generate savings information for multiple refrigerators. Incorporate the savings information and costs into NEAT's Itemized Cost section. Replace refrigerators if the measure has an SIR greater than or equal to 1.0. Replace existing refrigerators with a properly sized product meeting ENERGY STAR® standards. Replacement refrigerators are limited to one per household. De-manufacture and properly dispose of pre-existing unit.

If the owner has a list of refrigerators owned in all units, verify the accuracy of the list in the 25 percent sample of units audited. If no list exists, verify during the audit the make and model and age of every refrigerator to be replaced.

Remove, de-manufacture, and properly dispose of functional secondary refrigerators with R-12 refrigerant listed on the label, whenever possible. Offer a \$100 incentive for removal. Incentives may be paid for the removal of one unit per tenant household.

Specifications:

- 1) The refrigerator unit shall be top-freezer automatic defrost with no through the door ice or water and no automatic ice-maker.

- a. Bottom-freezer refrigerator units will be considered on a case-by-case basis for households with accessibility considerations.
 - b. Side-by-side refrigerator/freezer units are not an allowable weatherization installation.
- 2) Replacement refrigerators shall be properly sized for the tenant household. Match the size of the existing unit unless downsizing is an option.
- 3) De-manufacture and properly dispose all refrigerators removed.

Offer a \$100 incentive for removal of additional functional units not being replaced. Incentives to remove a unit may be paid for a maximum of one per tenant household.

D.5 Health and Safety Measures

General Policy: Health and Safety measures are defined as the cost of materials and labor necessary to eliminate or reduce hazards existing prior to, or potentially resulting from the installation of weatherization materials. Elimination of Health and Safety hazards, using Weatherization Program funds, shall be done in conjunction with the installed ECM. Products meeting ENERGY STAR® standards shall be used unless otherwise indicated. When using TREAT, include the Health and Safety measures in the building's improvement package. When using NEAT, include the Health and Safety measures in the Itemized Cost section. See also Chapter 12 – Health and Safety for further information on specific topics.

D.5.1 Depressurization and Worst Case Draft Testing

General Policy: Test the building's Combustion Appliance Zone (CAZ) for depressurization under worst case conditions. A Worst Case Draft (WCD) test shall be completed in every CAZ that has naturally vented combustion appliances, including gas or wood fireplaces, or space heaters. Each atmospherically vented appliance shall have an adequate draft and no spillage under Worst Case Draft (WCD) conditions. The depressurization tightness limits and adequate draft standards are outlined in the Weatherization Field Guide. See Air Sealing Specifications 4 through 7 below for specific approaches to building CAZ configurations. See the Weatherization Field Guide for depressurization testing procedures where they are applicable.

Specifications:

- 1) When feasible, isolate the CAZ from the rest of the building. Use fire-stopping materials as required by code.
- 2) Complete combustion safety tests on dwellings to ensure safe operation of all atmospheric vented appliances.
- 3) Ensure natural gas or LP water heaters and heating systems draft properly. Remedies for poor draft may include modifications to the flue or chimney, repairs or modifications to the furnace distribution system, or elimination of other negative pressures in the combustion zone.
- 4) In buildings with central heating systems, isolate the mechanical room (combustion appliance zone or CAZ) from the rest of the building.
 - a. Provide properly sized combustion air as needed.
 - b. Seal forced air distribution leaks in the CAZ.

- 5) In buildings with individual heating systems in each unit and/or common areas, identify the CAZ in each unit or area.
 - a. Ensure that there is properly sized combustion air for each appliance.
 - b. Test naturally drafting combustion appliances to ensure there is adequate draft under worst case depressurization conditions.
- 6) In buildings that incorporate a garage, determine the control methodology for managing combustion by-products.
 - a. Ensure that the exhaust ventilation is controlled effectively, operates properly, and is properly sized.
 - b. Where needed, install a carbon monoxide monitoring system that activates the garage ventilation equipment.
 - c. Where feasible, use diagnostic equipment to ensure that there are no air pathways between the garage and occupied areas.
- 7) All air sealing shall be completed using materials with the proper fire rating. See the Weatherization Manual, Chapter 11 on Weatherization Materials for more information.
- 8) Install carbon monoxide alarms in all units that have gas appliances.

D.5.2 Mechanical Ventilation

General Policy: Install properly sized mechanical ventilation when needed to ensure indoor air quality. Unless superseded by local codes, use 62.2 to calculate the requirements for continuous ventilation beyond the local exhaust ventilation requirements. Ventilation upgrades are not required unless the individual living unit requires more than 25 cfm of continuous ventilation. Whole building ventilation systems shall be properly commissioned as referenced below.

ASHRAE 62.2 “Ventilation and Acceptable Indoor Air Quality in Low-Rise Residential Buildings” covers low-rise residential structures up to 3 stories. When ASHRAE 62.2 is not applicable, follow the ventilation standards of the local authority having jurisdiction. The default code for all locations is WI Commercial Building Code Chapter 64, “Heating, Ventilating and Air Conditioning,” Table 64.0403, under the classification “Private dwellings, single and multiple living areas.” Installations shall adhere to any commissioning requirements, codes, and regulations by the authority having jurisdiction.

Unless blower door information is available to determine the natural ventilation rate, the required minimum ventilation to be installed is calculated using the ASHRAE 62.2 formula: $[7.5 \text{ CFM (bedrooms+1)} + .01 \text{ CFM (heated floor area)}]$ or Commercial Building Code Table 64.0403. This minimum rate may be adjusted for 62.2 when a blower door test is completed for the building and the measured natural ventilation is higher than presumed by ASHRAE 62.2. The installation of mechanical ventilation is not required in individual living units requiring 0 to 25 CFM of continuous ventilation. Exceptions, primarily for addressing local exhaust requirements, are cited below.

Specifications:

- 1) Whole building ventilation systems shall be properly commissioned when required by the local authority having jurisdiction.

- 2) Ensure that each individual living unit has functional local ventilation for the main bathroom. This local exhaust ventilation shall operate at a minimum of 50 cfm under customer operation.
- 3) Install continuous mechanical ventilation as required by ASHRAE 62.2 or WI Commercial Building Code Chapter 64 (Table 64.0403), as applicable. When using 62.2 the WI House Diagnostic Workbook, Page 1, may be used to calculate whole building and individual unit ventilation requirements.
- 4) Install ventilation only in individual living units requiring more than 25 cfm continuous ventilation. Exceptions include:
 - a. Install continuous local exhaust ventilation for moisture control in individual living units requiring 1-25 CFM, where the existing ventilation is not operated by the occupants for a sufficient length of time per day. Provide the customer with education on proper use of local ventilation.
 - b. Install local exhaust ventilation, either customer operated or continuous, for moisture control in individual living units requiring 1-25 CFM, where there is no ventilation. Provide the customer with education on proper use of local ventilation.
 - c. Install local exhaust in individual living units requiring 1-25 CFM and whole building ventilation in any building where there is documented evidence of indoor air problems.
 - d. Document the exception conditions that generated the installation of the ventilation.
- 5) Install (or restore existing) whole building supply ventilation in any building where there is documented evidence of indoor air problems.
 - d. Base whole building or individual unit ventilation requirements the number of bedrooms plus one or the number of occupants, whichever is greater (62.2), or the persons or cfm per square feet (Table 64.0403).
 - e. Document the exception conditions that generated the installation of the ventilation.
 - f. Utilize a controller which allows for an adjustment to the fan cfm based on changes to the household size. Ventilation controls shall give an on/off option for customers. The control shall be accessible to customers without removal of the faceplate. The building owner or maintenance staff shall be supplied with the equipment manufacturer's information and instructions for the adjustment of fan cfm.
- 6) In buildings that incorporate a garage, determine the control methodology for managing combustion by-products. If present, ensure that the exhaust ventilation is properly operating and properly sized. See WI Commercial Building Code Chapter 64 (Table 64.0403) for the minimum sizing requirements. See D.5.1 Depressurization and Worst Case Draft Testing, Specification 5 for more information on safety requirements for buildings that incorporate garages.

D.6 Repair

General Policy: Repair is defined as an improvement necessary for the effective performance or preservation of weatherization materials. Model needed repairs as a part of the improvement or the energy conservation measures with the energy audit. If the improvement/measure, modeled with the repair cost, has an SIR equal to or greater than 1.0, the measure may be completed. Examples of repairs include:

- Repair of leaking roofs.
- Repair of electrical systems.
- Repair of hot and cold water leaks.

D.7 Property Owner Education Standards

D.7.1 Project Record Documents

- 1) Maintain on site one set of the following record documents (record actual revisions to the work):
 - a. Drawings.
 - b. Specifications.
 - c. Addenda.
 - d. Change Orders and other modifications to the Contract.
 - e. Reviewed shop drawings, product data, and samples.
 - f. Manufacturer's instruction for assembly, installation, and adjustments.
- 2) Ensure entries are complete and accurate, enabling future reference by Property Owner.
- 3) Store record documents separate from documents used for construction.
- 4) Record information concurrent with construction progress.
- 5) Specifications - Legibly mark and record at each product section a description of actual products installed, including the following:
 - a. Manufacturer's name and product model and number.
 - b. Product substitutions or alternates utilized.
 - c. Changes made by Addenda and modifications.
- 6) Record Drawings - Legibly mark each item to record actual construction including:
 - a. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - b. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - c. Field changes of dimension and detail.
 - d. Details not on original Contract drawings.

D.7.2 Warranties and Bonds

- 1) The Division will consider requests to obtain a performance bond from contractors or subcontractors performing work on multifamily projects. See section 6.4.1 of this Manual for guidance on Bid/Performance Bonds.
- 2) Obtain warranties, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Property Owner's permission, leave date of beginning of time of

warranty until the Date of Substantial Completion is determined. (See Ch. 6.8 on Warranties).

- 3) Verify that documents are in proper form, contain full information, and are notarized.
- 4) Co-execute submittals when required.
- 5) Retain warranties and bonds until time specified for submittal.
- 6) Include originals of all warranties in operation and maintenance manuals, indexed separately on a table of contents.

D.7.3 Demonstration and Instruction

- 1) Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled time, at equipment location.
- 2) For equipment or systems requiring seasonal operation, perform demonstration for other season during seasonal change-over, not more than six months after equipment is placed in service.
- 3) Provide a qualified person who is knowledgeable about the Project to perform demonstration and instruction of Property Owner personnel.

D.8 NEAT User Defined Measures for 5-24 Unit Building Weatherization

Itemized Cost Tab: Default Include in SIR Settings

#	Type	Measure Name	Include In SIR
1	Building Insulation	DIA120 Attic Access - No Attic Insulation	No
1	Health and Safety	XHAL005 CO Detector New or Replace	Yes
2	Building Insulation	DIFO020 Exterior Foundation Insulation (Slab)	Yes
2	General Repairs	ZRAQ005 Dryer Venting	Yes
3	Baseloads	PCFL005 CFL Bulbs	Yes
3	Health and Safety	XHAR005 62.2 Exhaust Ventilation	No
4	Baseloads	PCFL020 Exterior CFL Bulbs	Yes
4	Health and Safety	XHAQ005 Worst Case Draft Test	No
5	Baseloads	PCFL025 CFL 3-Way Bulb	Yes
5	Health and Safety	XHAQ006 Worst Case Depressurization w/o Draft	No
6	Baseloads	PCFL010 Torchiere Replacement	Yes
6	General Repairs	ZRRS045 Ventilation - Soffit/Roof/Gable	Yes
7	HVAC Systems	JHSM035 Seal Ducts	No
7	General Repairs	ZRRS040 Other Repair	Yes
8	HVAC Systems	JHSM010 Disposable Filters	No
8	Health and Safety	XHHW007 Gas power vent from conventional gas	Yes
9	HVAC Systems	JHSM005 Clean and Tune	No
9	Health and Safety	XHHS025 Furnace Repair	Yes
10	HVAC Systems	JHSM015 Setback Thermostat	No
10	Health and Safety	XHHW010 Water Heater Repair	Yes
11	HVAC Systems	JHSM030 Insulate Ducts	No
11	Health and Safety	XHAQ045 Gas Leak Repair	No
12	HVAC Systems	JHSM011 Cleanable Filters	No
12	Health and Safety	XHAQ035 Air Quality Other Remediation	Yes
13	Baseloads	MWHT020 Showerhead	No
13	Health and Safety	XHAQ007 Chimney Liner	Yes
14	Baseloads	MWHT005 Flow Restrictors	Yes
14	Health and Safety	XHAL010 Smoke Detector New or Replace	Yes
15	Baseloads	MWHT010 Pipe Insulation	No
15	Health and Safety	XHEL015 Upgrade or Repair Electric	Yes
16	Baseloads	MWHT025 Tank Insulation	No
16	Health and Safety	XHAL020 Combo Smoke/CO Detector	Yes
17	Baseloads	MWHT015 Reduce Temperature	No
17	General Repairs	ZREL005 Upgrade or Repair Electric Service	Yes
18	Baseloads	VFR005 Freezer Replacement	No

#	Type	Measure Name	Include In SIR
18	General Repairs	ZREL015 Knob and Tube Replace Attic	Yes
19	Baseloads	URR005 Refrigerator Replacement	Yes
19	Health and Safety	XHHS020 Furnace Replace	Yes
20	Baseloads	VFR010 Freezer Removal	No
20	Health and Safety	XHAQ040 Cook Stove Repair	Yes
21	Baseloads	URR010 Refrigerator Removal	No
21	Health and Safety	XHAP015 Appliance Repair or Replace	Yes
22	HVAC Systems	JHSM020 First Floor Ductwork	Yes
22	Health and Safety	XHHW005 Water Heater Replace	Yes
23	HVAC Systems	JHSM025 Second Floor Ductwork	Yes
23	General Repairs	ZRHW010 Plumbing Repair or Replace	Yes
24	HVAC Systems	JBM010 Compression Tank	Yes
24	General Repairs	ZRHW005 Water Heater Repair	Yes
25	HVAC Systems	JBM035 Backflow Preventer	Yes
25	General Repairs	ZRRS030 Door Replacement R9	Yes
26	HVAC Systems	JBM005 Automatic Fill Valve	Yes
26	Health and Safety	XHHS030 Ducts Repair or Replace	Yes
27	HVAC Systems	JBM060 Boiler Distribution System Modifications	Yes
27	Health and Safety	XHSS035 Structure Other Remediation	Yes
28	HVAC Systems	JBM055 Zone Valves	Yes
28	General Repairs	ZRHS030 Thermostat Replacement - Not ENERGY STAR®	Yes
29	HVAC Systems	JBM025 Radiator New or Replacement	Yes
29	General Repairs	ZRRS005 Chimney	Yes
30	HVAC Systems	JBM040 Modulating Aquastat	Yes
30	Health and Safety	XHHW015 Plumbing Repair or Replace	Yes
31	HVAC Systems	JBM020 Outdoor Reset	Yes
31	General Repairs	ZRRS035 Window Replacement U .30	Yes
32	HVAC Systems	JBM030 Radiator Valves	Yes
32	Health and Safety	XHAQ030 Asbestos Removal	Yes
33	HVAC Systems	JBM045 Intermittent Ignition Device (IID)	Yes
33	General Repairs	ZRRS010 Floors	Yes
34	HVAC Systems	JBM015 Electric Vent Damper	Yes
34	Health and Safety	XHHW004 Electric to Electric .94	Yes
35	Baseloads	PCFL015 LED Exit Light	Yes
35	Health and Safety	XHAQ025 Dehumidifier New or Replace	Yes
36	Baseloads	PCFL030 Fixture Replacement	Yes
36	General Repairs	ZREL020 Knob and Tube Replace Walls	Yes

#	Type	Measure Name	Include In SIR
37	HVAC Systems	VNT001 Exhaust Ventilation	Yes
37	General Repairs	ZRRS020 Walls	Yes
38	HVAC Systems	VNT005 Ventilation Controls	No
38	General Repairs	ZRRS015 Roof	Yes
39	HVAC Systems	VNT010 Heat or Energy Recovery Ventilator	No
39	Health and Safety	XHHS010 Boiler Repair	Yes
40	General Heat Waste and Air Infiltration	ABD010 Blower Door Setup	No
40	Health and Safety	XHHS060 Electric Repair	Yes
41	Health and Safety	XHAR015 Heat or Energy Recovery Ventilator	No
42	HVAC Systems	JHSR007 Gas Boiler – ENERGY STAR®	Yes
42	Health and Safety	XHHS005 Boiler Replace	Yes
43	HVAC Systems	JHSR010 Gas Forced Air 90%	Yes
43	Health and Safety	XHSS005 Chimney	Yes
44	HVAC Systems	JHSR035 Oil Boiler	Yes
44	Health and Safety	XHAR010 Exhaust Ventilation with Makeup Air	No
45	HVAC Systems	JHSR040 Oil Forced Air	Yes
45	Health and Safety	XHHW008 Gas power vent from electric	Yes
46	Baseloads	MWHC005 Gas power vent from conventional gas	Yes
46	Health and Safety	XHHS035 Space Heater Replace	Yes
47	Baseloads	MWHC010 Gas power vent from electric	Yes
47	Health and Safety	XHSS010 Floors	Yes
48	Baseloads	MWHC035 Indirect Fired Water Heater	Yes
48	Health and Safety	XHHS015 Boiler Radiators, Repair or Replace	Yes
49	Baseloads	MWHR005 Electric Upgrade .94	Yes
49	Health and Safety	XHSS015 Roof	Yes
50	Health and Safety	XHSS020 Walls	Yes
51	Health and Safety	XHHS050 Wood Repair	Yes
52	Health and Safety	XHHS040 Space Heater Repair	Yes
53	Health and Safety	XHHS055 Electric Replace	Yes
54	Health and Safety	XHSS030 Lead Paint Remediation	Yes
55	Health and Safety	XHHS045 Wood Replace	Yes
*	Health and Safety	XHAR007 Local Exhaust Ventilation	No
*	Health and Safety	XHAR009 Venting Existing Exhaust	No

* New Item